SCOPE

This procedure covers the "in-plant" engineering test requirements for SARA SAE manifold components (crosses, tees, buffer chambers, spools, etc.) and manifold assembly.

1.0 MANIFOLD COMPONENTS - BODY HYDROSTATIC SHELL TEST

1.1 Test Pressures

1.1.1 The body or shell test pressure shall be determined by the rated working pressure for the equipment. Hydrostatic test pressures shall be shown in Table 1.

1.1.2 For a member with end or outlet connections having different working pressures, the lowest working pressure rating shall be used to determine the shell test pressure.

1.2 Hydrostatic shell testing shall be completed prior to painting; however, if the bodies and other pressure containing parts have been made of wrought material, tests may be completed after painting. Also, painted units from stock may be retested without removing the paint.

1.3 Pressure holding periods shall not start until the test pressure has been obtained and allowed to stabilize. External surfaces shall be dried thoroughly before testing.

1.4 Body Shell Test Procedure

1.4.1 Flange up all connections utilizing appropriate size ring joint gaskets. Refer to Table 2 and 3 for ring gasket size and/or SARA SAE part numbers.

NOTE: Rubber coated API ring joint gaskets are NOT permitted.

1.4.2 Each unit and test stool are to be connected with other test apparatus as illustrated in Figure 1. Note that block valve B is to remain open at all times during the test.

1.4.3 Fill unit with water. Make sure all air is expelled from the unit.

1.4.4 Except for manifold components, PSL-1 and PSL-2, place chart, identified with Serial Number and/or Factory Order Number on Recorder.

1.4.5 Place safety test bell, or other protective device, over component.

1.4.6 Pressurize to shell test pressure as determined by unit working pressure and end connections per Paragraph 1.1 (see Table 1). Hold

for a minimum of three minutes. Check for leaks. Bleed to zero pressure.

1.4.7 Repressurize to shell test pressure as in 1.4.6. Hold for a minimum of 15 minutes. Bleed to zero pressure.

1.4.8 The unit is acceptable if there is no visible evidence of leakage.

2.0 MANIFOLD COMPONENTS - DRIFT TEST

2.1 Adapter and drilling spools shall be drift tested after the completion of the body hydrostatic shell test. The diameter and gauge length of the mandrel shall be in accordance with Table 2.

2.2 Pass the drift mandrel through the bore.

2.3 The component is acceptable if the mandrel passes through without being forced.

2.4 Record the results of the test.

3.0 MANIFOLD ASSEMBLY

3.1 The test pressure shall be the rated working pressure of the manifold.

3.2 Pressure holding periods shall not start until the test pressure has been obtained and allowed to stabilize. External surfaces shall be dried thoroughly before testing.

3.3 Test Procedure:

3.3.1 Flange up all connections utilizing appropriate size ring joint gaskets. Refer to Table 2 and 3 for ring gasket size and/or SARA SAE part numbers.

NOTE: Rubber coated API ring joint gaskets are NOT permitted.

3.3.2 The manifold is to be connected with other test apparatus as illustrated in Figure 1 (test component in Figure 1 is the manifold). Note that block valve B is to remain open at all times during the test.

3.3.3 Fill the manifold with water. Make sure all air is expelled from the manifold assembly.

3.3.4 Pressurize to the rated working pressure of the manifold. Hold for a minimum of three minutes. Check for leaks. Bleed to zero pressure.

3.3.5 Re-pressurize to the rated working pressure as in 3.3.4. Hold for a minimum of 15 minutes. Bleed to zero pressure.

3.3.6 The manifold is acceptable if there is no visible evidence of leakage.

4.0 HYDRAULIC CONTROL LINES (IF APPLICABLE)

4.1 Pressure holding periods shall not start until test pressure has been reached and allowed to stabilize. External surfaces shall be dried thoroughly before testing.

4.2 Tap water with or without additives or hydraulic fluid shall be used as testing fluid for valve. Only hydraulic fluid shall be used as testing fluid for choke.

4.3 Verification of the hydraulic lines to the correct valves/chokes shall be done concurrently with the test.

4.4 Test Procedure

4.4.1 Vent "close" line to atmosphere.

4.4.2 Pressurize the valve/choke hydraulic chamber through the "open" line to 3000 psi (+200 psi, -0). Hold for a minimum of three (3) minutes. Check for leaks. Bleed to zero pressure.

4.4.3 Repeat step 4.4.2.

4.4.4 Vent "open" line to atmosphere.

4.4.5 Pressurize the valve/choke hydraulic chamber through the "close" line to 3000 psi (+200 psi, -0). Hold for a minimum of three (3) minutes. Check for leaks. Bleed to zero pressure.

4.4.6 Repeat step 4.4.5.

4.5 Repeat step 4.4 for each pair of hydraulic lines.

4.6 The test is acceptable if there is no visible evidence of leakage during each holding period.

TABLE NO. 1
PRESSURE TABLE FOR FLANGE OR HUB CONNECTIONS

WORKING PRESSURE (+5%, -0%) PSI (MPa)		SHELL TEST PRESSURE (+5%, -0%) PSI (MPa)	
1,000 (6.9)	+50 (0.3), -0	2,000 (13.8)	+100 (0.7), -0
2,000 (13.8)	+100 (0.7), -0	4,000 (27.6)	+200 (1.4), -0
3,000 (20.7)	+150 (1.0), -0	6,000 (41.4)	+300 (2.1), -0
5,000 (34.5)	+250 (1.7), -0	7,500 (51.7)	+375 (2.6), -0
10,000 (69.0)	+500(3.5), -0	15,000 (103.4)	+750 (5.2), -0
15,000 (103.4)	+750 (5.2), -0	22,500 (155.0)	+1125 (7.8), -0

TABLE NO. 2
R & RX RING JOINT GASKETS FOR TESTING

Flange		R Low Carbon Steel Cadmium Plated			RX Low Carbon Steel Cadmium
Working Pressure Psi (MPa)	Nominal Size in. (mm)	R or RX Number	Oval	Octagon	
2000 (13.8)	2-1/16 (52)	23	050192	050164	050376
3000 (20.7), 5000 (34.5)	2-1/16 (52)	24	050193	050165	050380
2000 (13.8)	2-9/16 (65)	26	050194	050166	050381
3000 (20.7), 5000 (34.5)	2-9/16 (65)	27	050195	050167	050382
2000 (13.8), 3000 (20.7)	3-1/8 (79)	31	050196	050168	050383
5000 (34.5)	3-1/8 (79)	35	050197	050169	050384
2000 (13.8), 3000 (20.7)	4-1/16 (103)	37	050198	050170	050385
5000 (34.5)	4-1/16 (103)	39	050199	050171	050386
3000 (20.7)	5-1/8 (130)	41	050200	050172	050387
5000 (34.5)	5-1/8 (130)	44	--	--	050388
2000 (13.8), 3000 (20.7)	7-1/16 (179)	45	050201	050173	050373
5000 (34.5)	7-1/16 (179)	46	050202	050174	050389

TABLE NO. 3
BX RING GASKETS FOR TESTING

Flange		BX Number	Low Carbon Steel Cadmium Plated
Working Pressure Psi (MPa)	Nominal Size in. (mm)		
10,000 (69.0), 15,000 (103.4) 20,000 (138.0)	1-13/16 (46)	151	050352
	2-1/16 (52)	152	050353
	2-9/16 (65)	153	050354
	3-1/16 (78)	154	050355
	4-1/16 (103)	155	050366
	7-1/16 (179)	156	050356

TABLE NO. 4
DRIFT TEST MANDRELS

Valve Bore Diameter in. (mm)	Mandrel Diameter in. (mm)	Minimum Mandrel Length in. (mm)
1-13/16 (46)	1.78 (45.20)	3.00 (76)
2-1/16 (52)	2.03 (51.60)	3.00 (76)
2-9/16 (65)	2.53 (64.30)	3.00 (76)
3-1/16 (78)	3.03 (77.00)	3.06 (78)
4-1/16 (103)	4.03 (102.40)	4.06 (103)
5-1/8 (130)	5.09 (129.40)	5.12 (130)
7-1/16 (179)	7.03 (178.60)	7.06 (179)

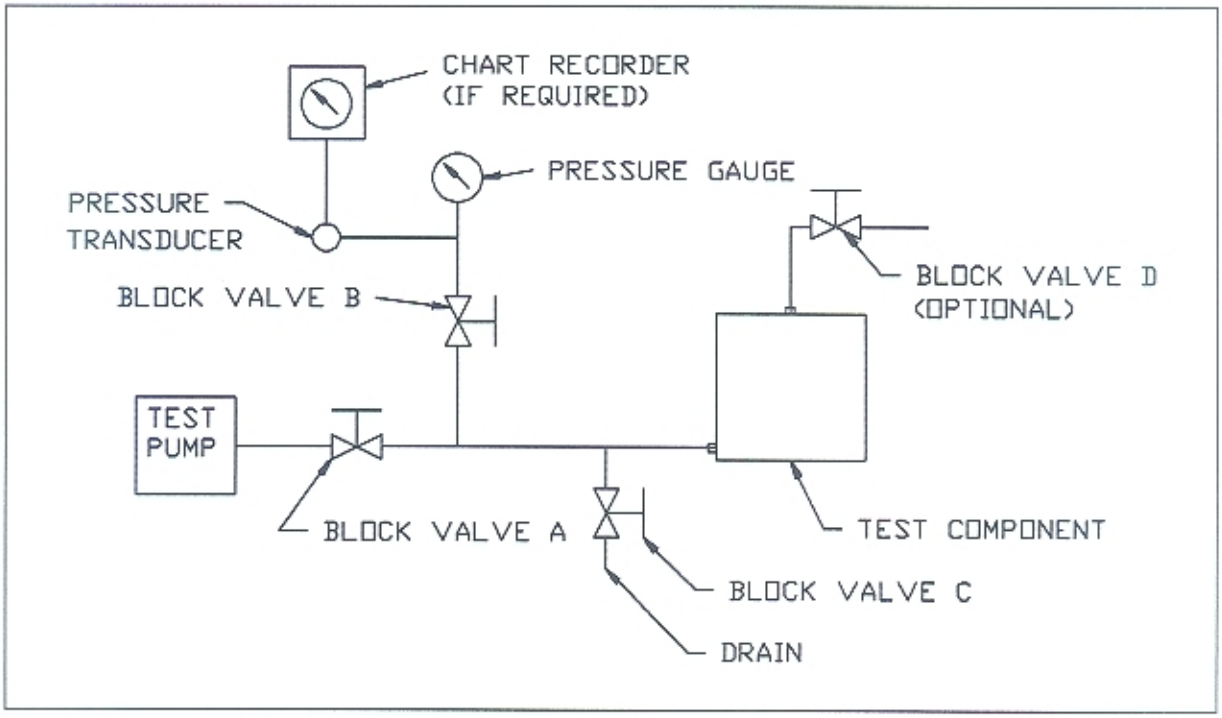

FIGURE 1